

In re: Cesaroni et al.
Appl. No.: 10/044,473
Filed: January 10, 2002
Page 2

In The Claims:

1. (Original) A hybrid propulsion system comprising:
a liquid fuel section containing an aqueous solution of hydrogen peroxide and a solid fuel section containing a fuel grain; and
an injector system located between the liquid fuel section and the solid fuel section, said injector system introducing a stream of hydrogen peroxide or decomposed hydrogen peroxide at elevated temperature into the solid fuel section to effect combustion of the fuel grain.
2. (Original) The hybrid propulsion system of Claim 1 in which the hydrogen peroxide is in a concentration of 50-98 percent by weight.
3. (Original) The hybrid propulsion system of Claim 2 in which the concentration of hydrogen peroxide is in the range of 70-90 percent by weight.
4. (Original) The hybrid propulsion system of Claim 1 in which the injector system contains a catalyst for decomposition of hydrogen peroxide to produce a stream of decomposed hydrogen peroxide at elevated temperatures.
5. (Original) The hybrid propulsion system of claim 4 in which the catalyst is selected from a group consisting of platinum, silver, platinum or silver coated nickel, and nickel coated with a combination of silver and samarium nitrate.
6. (Original) The hybrid propulsion system of claim 1 in which the injector system decomposes said stream of hydrogen peroxide by use of heat.

In re: Cesaroni et al.
Appl. No.: 10/044,473
Filed: January 10, 2002
Page 3

7. (Original) The hybrid propulsion system of claim 1, in which the solid fuel section contains a catalyst to decompose hydrogen peroxide, introduced to said solid fuel sections by said injector.

8. (Currently Amended) The hybrid propulsion system of Claim 7 wherein said catalyst in said solid fuel section is selected from the group consisting of platinum, silver, platinum or silver coated nickel and nickel coated with a combination of silver and samarium nitrate.

9. (Original) The hybrid propulsion system of Claim 1 in which the aqueous solution of hydrogen peroxide additionally contains at least one of ammonium dinitramide and hydrazinium nitroformate.

10. (Previously Amended) The hybrid propulsion system of Claim 9 in which the amount of ammonium dinitramide or hydrazinium nitroformate is in the range of 5-50% by weight.

11. (Original) The hybrid propulsion system of Claim 1 in which the aqueous solution of hydrogen peroxide additionally contains an oxidizer in solution or in suspended particulate form.

12. (Previously Amended) The hybrid propulsion system of Claim 11 in which the oxidizer is selected from the group consisting of chlorates, perchlorates and nitrates.

13. (Previously Amended) The hybrid propulsion system of Claim 12, in which the oxidizer is selected from the group consisting of ammonium perchlorate and ammonium nitrate.

In re: Cesaroni et al.
Appl. No.: 10/044,473
Filed: January 10, 2002
Page 4

14. (Original) The hybrid propulsion system of Claim 11 in which the aqueous solution of hydrogen peroxide additionally contains stabilizers such as chelating agents in order to increase storage stability.

15. (Currently Amended) The hybrid propulsion system of Claim 1 in which the fuel grain additionally contains a metal.

16. (Previously Amended) The hybrid propulsion system of Claim 15 in which the metal is a hydro-reactive metal.

17. (Original) The hybrid propulsion system of Claim 16 in which the hydro-reactive metal is selected from the group consisting of aluminum, magnesium, boron, beryllium, lithium and silicon, mixtures thereof, or hydride forms thereof.

18. (Previously Amended) The hybrid propulsion system of Claim 15 in which the metal is in the form of an alloy.

19. (Original) The hybrid propulsion system of Claim 1 in which the fuel grain contains a solid oxidizer.

20. (Original) The hybrid propulsion system of Claim 19 in which the solid oxidizer is selected from the group consisting of ammonium perchlorate, ammonium nitrate, hydrazinium nitroformate, ammonium dinitramide, hydroxylammonium nitrate, hydroxylammonium perchlorate, nitronium perchlorate and mixtures thereof.

21. (Original) The hybrid propulsion system of Claim 1 in which the fuel grain contains an energetic filler.

In re: Cesaroni et al.
Appl. No.: 10/044,473
Filed: January 10, 2002
Page 5

22. (Original) The hybrid propulsion system of Claim 21 in which the energetic filler is selected from the group consisting of cyclotrimethylene trinitramine, cyclotetramethylene tetranitramine, hexanitroisoazowurzitane, and mixtures thereof.

23. (Original) The hybrid propulsion system of Claim 1 in which the fuel grain contains an energetic plasticizer.

24. (Previously Amended) The hybrid propulsion system of Claim 23 in which the energetic plasticizer is selected from the group consisting of butanetriol trinitrate, trimethylolethane trinitrate, triethyleneglycol dinitrate, glycidyl azide plasticizer and mixtures thereof.

25. (Original) The hybrid propulsion system of Claim 1 in which the fuel grain contains an energetic polymer.

26. (Original) The hybrid propulsion system of Claim 24 in which the energetic polymer is selected from the group consisting of glycidyl azide polymer, bis-azidomethyloxetane/azidomethyl-methoxetane copolymer and nitramethyl-methoxetane polymers, and mixtures thereof.

27. (Original) The hybrid propulsion system of Claim 1 in which the fuel grain contains a ballistic or processing modifier.

28. (Original) The hybrid propulsion system of Claim 1 in which the fuel grain contains a hydrogen peroxide decomposition catalyst.

In re: Cesaroni et al.
Appl. No.: 10/044,473
Filed: January 10, 2002
Page 6

29. (Original) The hybrid propulsion system of Claim 28 in which the decomposition catalyst is selected from the group consisting of potassium permanganate and manganese dioxide.